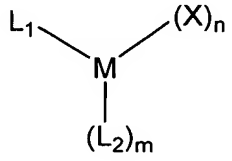
I claim:

1. A process comprising polymerizing an olefin in the presence of a clay, an activator, and a transition metal complex having at least one pyridine moiety-containing ligand.

2. The process of claim **1** wherein the transition metal complex has the general structure:

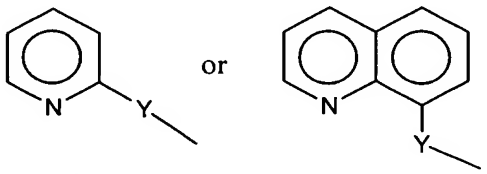


wherein M is a transition metal; L_1 is a pyridine moiety-containing ligand; L_2 is a ligand selected from the group consisting of L_1 ligands, cyclopentadienyls, indenyls, fluorenyls, boraaryls, azaborolinyls, indenoindolyls, and phosphinimines; X is a ligand selected from the group consisting of alkyl, aryl, alkoxy, aryloxy, halide, dialkylamino, and siloxy groups; and the sum of n and m satisfies the valence of M.

3. The process of claim **2** wherein M is a Group 4 transition metal.

4. The process of claim **2** wherein the M is Ti or Zr.

5. The process of claim **2** wherein L_1 has the general structure:



wherein Y is bonded to M and is selected from the group consisting of O, S, and NR wherein R is hydrogen or an alkyl group; one or more of the remaining ring atoms are optionally and independently substituted by alkyl, aryl, aralkyl, alkylaryl, silyl, halogen, alkoxy, aryloxy, siloxy, nitro, dialkyl amino, or diaryl amino groups and two adjacent substituents optionally form a ring structure.

6. The process of claim **1** wherein the olefin is selected from the group consisting of ethylene, propylene, 1-butene, 1-pentene, 1-hexene, 1-octene, 4-methyl-1-pentene, and mixtures thereof.

7. The process of claim **1** wherein the olefin is a mixture of ethylene and a C_3 to C_{10} α-olefin.

8. The process of claim **1** wherein the olefin is ethylene.

9. The process of claim **1** wherein the activator is selected from the group consisting of alumoxanes, alkyl aluminums, alkyl aluminum halides, anionic compounds of boron or aluminum, trialkylboron and triarylboron compounds, and mixtures thereof.

10. The process of claim **1** wherein the activator is methylalumoxane (MAO) or polymeric MAO.

11. The process of claim **1** wherein the activator is tris-(pentafluorophenyl)borane.

12. The process of claim **1** wherein the transition metal complex is 8-quinolinoxytitanium trichloride.

13. The process of claim **1** wherein the transition metal complex is 8-quinolinoxytitanium tribenzyl.

14. The process of claim **1** wherein the clay is selected from the group consisting of montmorillonite, saponite, hectorite, mica, vermiculite, bentonite, nontronite, beidellite, volkonskoite, magadite, and kenyaite, and mixtures thereof.

15. The process of claim **1** wherein the clay is an organoclay.

16. The process of claim **1** wherein the clay is heat-treated prior to the polymerization.

17 The process of claim **1** wherein the complex is supported.

18. The process of claim **1** wherein the complex is supported on silica.

19. A process for producing an ultra-high molecular weight polyethylene (UHMWPE), said process comprising polymerizing ethylene in the presence of a supported transition metal complex having at least one pyridine moiety-containing ligand at a temperature within the range of about 40°C to about 110°C in the presence of the supported catalyst of step (a), a clay, and a

non-alumoxane activator, in the absence of aromatic solvent, α-olefin comonomer, or hydrogen, said UHMWPE having a weight average molecular weight (Mw) greater than about 3,000,000 and molecular weight distribution (Mw/Mn) less than about 5.0.

20. The process of claim **19** wherein the non-alumoxane activator is selected from the group consisting of trialkyl amines, alkyl aluminums, alkyl aluminum halides, anionic compounds boron or aluminum, trialkyl boron compounds, triaryl boron compounds, and mixtures thereof.

21. The process of claim **19** wherein the activator is triethyl aluminum.

22. The process of claim **19** wherein the clay is an organoclay.

23. The process of claim **19** wherein the transition metal complex is quinolinoxytitanium trichloride or 8-quinolinoxytitanium tribenzyl.

24. An UHMWPE made by the process of claim **1** that has a bulk density greater than 0.26 g/cc.

25. An UHMWPE containing a clay.